

Response to Office Action mailed April 4, 2006
U.S. Application No. 10/657,360

REMARKS

Election/Restrictions

Consistent with the indication in the Office Action and the telephone conversation on 04/24/06, Applicant affirms election of Claims 13-41, Group II, drawn to a process and product for prosecution in this application. The election is with traverse because the parent application demonstrates the consistency of the subject matters for examination and issuance for both apparatus and process claims.

Claims 13-41 remain in this application.

Claim Rejections

Claim 41 rejected under 35 USC 102 over Khan, US Patent No. 6,059,957

Claim 41 covers an upgraded heavy oil made by the process of the invention. Khan's processes all use emulsions with agents and catalysts that will inherently leave a small portion of such materials in the upgraded heavy oil product. Similarly, other catalytic methods leave residues which will not be found in the crude upgraded according to the invention using only a syngas and or steam or similar hydrogen source. Accordingly, an upgraded heavy oil according to the invention is different from the disclosed upgraded heavy hydrocarbons. Reconsideration is requested.

Claims 13-18, 20, 21, 25-27, and 34-40 rejected under 35 USC 103 over Chahvekilian, US Patent No. 3,842,138 in view of Khan and Gomi US Patent No. 3,689,401

Regarding claims 13-17, 24, 36, and 37, the rejection relies on Chahvekilian for a disclosure of thermally cracking heavy distillate crude oil at 625-1000 C for 0.01 to 0.5 seconds with hydrogen followed by quenching with heavy oil. Khan is cited for disclosure of gas recycle and Gomi for stabilizing cracked products at 40-200 C for 0.1 to 2 hours. Applicant respectfully traverses the rejection because the primary reference Chahvekilian does not show heavy oil upgrading, but rather distillate cracking; Khan does not show heavy oil recycle, and Gomi does not teach or suggest heavy oil stabilization.

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Chahvekilian

The reference is directed to a hydrocracking process and relates also to competitive steam cracking processes but does not relate to contacting a heavy oil liquid with a hydrogen-containing gas for thermal cracking. The heavy oils of the invention are discussed in the specification at paragraphs [0003-0004]. They have very low API gravities and the bitumens given in Table 6 (page 32) and Table 4 (page 34) are representative of heavy oils. Therein, these heavy oils are shown to be in a range wherein almost half of the material fractionates above 1050 F (565.6 C). Compare the distillates in the examples of Chahvekilian at columns 8-10 and the Examples wherein 70-90% of the material boils below 420 C. Accordingly, Chahvekilian is directed to olefins production rather than just improvement in a very heavy API, e.g. The feeds of Chahvekilian are found far downstream from the feeds of the invention.

Khan

Khan also does not show the heavy oil upgrade process of the invention but rather different upgrade techniques. Also, the gas recycle of Khan in no way suggests the product recycle of the invention.

Gomi

Gomi is another hydrocracking process which discloses at column 3, lines 10-30 catalytic hydrogenation followed by organic sulfur treatment for stabilization of the mostly aromatic by-product fraction of a cracking process designed to produce olefins. Stabilization of heavy oil is not suggested.

Since the principal reference fails to disclose a process for upgrading heavy oil, then the other references do not provide sufficient disclosure for the rejection to stand. Similarly, the further rejections of claims 18, 20, 21, 25-27, and 34-40 are improper because the base process is not revealed. Reconsideration and allowance of the claims are solicited.

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Claims 22, 23, 32, and 33 rejected under 35 USC 103 over Chahvekilian in view of Khan and Gomi further in view of Gregoli US Patent No. 6,016,868

Regarding claims 22, 23, 32, and 33 are drawn to conversion limitations. The rejection relies further on Gregoli for disclosure of low amounts of C1-C4 hydrocarbons and high conversion of 1050 F products. This rejection fails because the primary reference does not provide a heavy oil upgrade process and the other references do not suggest the claimed invention. The data from Tables 10 and 6 and elsewhere in Gregoli are not from a heavy oil upgrade process but rather from another system of processes that handle crude production. The present invention is not taught or suggested. Withdrawal of the rejection and allowance of the claims are solicited.

Claims 19 and 29-31 rejected under 35 USC 103 over Chahvekilian in view of Khan and Gomi and further in view of Benham US Patent No. 6,004,453

Benham is cited for disclosure that product yields increase with recycle and increased reaction temperature without coke formation or with low coke formation. However, Benham, like the primary reference does not show a heavy oil upgrade process as claimed with a hydrogen-containing gas followed by quenching and stabilization. Benham discloses a slurry process with coke-inhibiting additives. Reconsideration and allowance of the claims are solicited.

Claim 28 rejected under 35 USC 103 over Chahvekilian in view of Khan, Gomi, and further in view of Fuderer US Patent No. 4,822,521

Fuderer is cited for its disclosure of feed rate of natural gas to provide a hydrogen stream and steam to hydrocarbon feed ratio. Since the primary and other references fail to teach the heavy oil upgrade process of the invention, reconsideration and allowance of the claims is solicited.

Double Patenting

Claims 1 and 16 were rejected over claim 1 of US Patent No. 6,852, 215 in view of Gomi;

Claim 15 was rejected over claim 4 of US Patent No. 6,852,215; and

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Claims 25 and 28 were rejected over claims 2, 5, and 6 of US Patent No. 6,852,215 in view of Fuderer.

Applicant requests removal of these rejections in view of the terminal disclaimer over commonly owned US Patent No. 6,852,215, submitted herewith.

In view of the above, a Notice of Allowance is earnestly solicited.

Respectfully submitted,

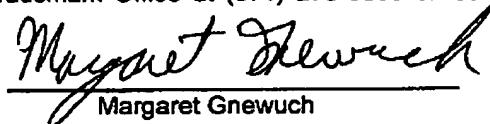


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I hereby certify that this correspondence is being transmitted via facsimile to Examiner Christopher, Technology Center 1700, United States Patent and Trademark Office at (571) 273-8300 on June 28, 2006.



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